

Survey Says: More Oil Producers Moving Toward a Risk-based Approach for Asset Life Extension

Producers have discovered that a risk-based inspection approach can cut costs if it's implemented properly, says an OGIQ survey. Now, it's a matter of increasing the adoption rate.

By Anne-Marie Walters

While the low price of oil is providing relief to consumers at the gas pump, pressure is being put on offshore oil producers in this current economic environment to get more life out of the platforms they have rather than building new. Determining how to get more out of existing assets and extend their life in the offshore environment is a pressing problem for owners and the engineering companies that support them. As a result, many owner-operators are looking to optimize their resources and take a risk-based approach to monitoring their assets. A recent survey of producers conducted by Oil and Gas IQ (OGIQ) and Bentley Systems shows the extent of this trend.

Many offshore platforms in the Gulf of Mexico and the North Sea are 40 years old or more, and they have gone well beyond their expected life of 25 years. In these challenging times, though, owners cannot afford to install new platforms. So, they are leaning on analytic software technologies to analyze structural integrity and determine risks, and explore options to prolong asset life. A surprising result of the survey, though, is that even producers with assets that are less than 10 years old are looking at how to extend asset life –working out options to get more from their existing assets rather than build new. When asked what the most important drivers for reassessment are, 97 percent of those surveyed said field life extension, making it the most important business driver. Other just as important drivers for reassessment include new production equipment that puts more weight on platforms, subsea tiebacks, and changing meteorological data. But, life extension is clearly the main focus of producers.

Adhering to inspection standards is another challenge facing oil producers. When asked what compliance codes producers were using, more than half responded they were using ISO 19902, and another half used HSE in the North Sea. But the most interesting number is the 19 percent that are using RP2SIM, a relatively new standard that came into being in 2014. This standard is defined as an ongoing process for ensuring the continuing fitness-for-purpose of an offshore structure or fleet of structures. While this standard is in the early adoption phase, it is expected to lead to the next stage of adoption – the risk-based approach. The fact that this new code is at nearly 20 percent adoption shows that producers are constantly monitoring the assets and thinking about life extension.

The OGIQ survey backs up this opinion with 34 percent of producers adopting a risk-based approach to maintenance, clearly putting them beyond the early adoption phase. Producers have discovered that a risk-based inspection approach can cut costs if it's implemented properly, and they can actually use it to optimize inspection schedules.

When asked if producers perform the engineering analysis in-house, 39 percent said they do while 59 percent responded that they conduct both in-house and contracted-out analysis, which shows that, with owners comprising 70 percent of IGQC readers, owners are addressing the problem. While it would seem that structural integrity management would be easy to outsource, the survey shows that it is too important for them to outsource. It is critical to their business, for managing their assets and for productivity improvement.

Moving to what kind of technology producers are using, the vast majority, at nearly 80 percent, are still carrying out inspections manually. This figure presents a huge opportunity for using mobile technologies to support manual data collection. Although the industry is a conservative one, it is not averse to using new technologies to streamline costs. Essentially, four out of five respondents need to physically see what is in front of them, but they are using technology to support the manual capture of as-built information, not replace it. Then, the question becomes, how do producers hold this data – in spreadsheets, with a good document management system, or by using a formalized process for storing and retrieving information used by all inspectors.

The survey results show that nearly 50 percent of respondents have a document management system, not a formalized process, which means there is potential for owners to perform inspections more efficiently. It also means that the 39 percent of those surveyed that are using a more formalized approach to their inspections can navigate the risk-based route much more easily. They are able to store and retrieve information used by all inspectors. The purpose of a formalized process, essentially, is to ensure that appropriate notifications are delivered across the organization, which enables an organization to function effectively. The respondents also said poor communication across departmental silos (41 percent) is another major challenge.

Lastly, the survey tackles alternative ways to conduct inspections that include mobile devices, unmanned aerial vehicles, cloud technology and laser scanning. With regard to using mobile devices to conduct the inspection process, only 32 percent of respondents said they were using them, which means there is great potential for adopting more of this technology. According to Phil Christensen, VP of analytical modeling with Bentley Systems, those with paper-based workflows are hesitant to adopt mobile devices fearing they could drop them in the water or not know how to back up the device when out on the platform. But with 32% adopting this technology, clearly some have overcome these challenges.

Interestingly, the adoption of UAVs is rapidly making inroads in the industry with more than a quarter already using them. Christensen says he is encouraged by this number, as he guessed that the percentage of users would only be around 10 percent. Christensen is also surprised by the number of respondents using cloud technology. With a quarter of the audience adopting it, Christensen says we are just beyond the early adopter stage with users becoming more relaxed about issues of security. He adds that some Bentley users are asking for cloud-only solutions of the products it offers. These unsolicited requests specifically demand a solution to their data needs that is not on premise, validating that the thinking among oil producers has changed.

Some Examples from the Field

The takeaway from the survey is that producers are seeking alternative ways to inspect, maintain, and extend the life of their assets. It is no different from an individual taking their car into the mechanic for general maintenance and tune ups. Let's examine how three owner-operators are implementing analysis software to maintain their offshore platforms and assets.

Oil and Natural Gas Corporation currently operates more than 265 offshore fixed jacket platforms in waters off the coast of India that have outlived their 25-year design life. Installing new platforms would cost the company USD 25 million per platform. Instead, ONGC saw the value of asset life extension and

invested USD 150 million to assess its jacketed platforms for extended fit for user and strengthen the platforms as required to meet industry safety standards.

ONGC deployed Bentley's SACS for design-level analysis to carry out detailed structural analyses and SACS collapse for ultimate strength analysis. The analyses included dent modeling, member/joint component strengthening, additional pile modeling, and soil convergence, as well as extensive load modeling to recommend equipment removal if necessary. The technology became part of ONGC's methodology for platform life extension/requalification, which added 10-15 years to the average life of each structure.

In the Chenqdoa oilfield in Bohai Bay, a number of offshore platforms have reached the end of their design life, and needed to be reassessed for extended life and to ensure safe operation. China-based oil producer **Sinopec** performed underwater inspection of the platforms to evaluate their structural security and determine their maintenance feasibility. It relied on analytical software to evaluate the structural integrity of the platforms and consider the maintenance alternatives based on the analytical data required for safe operation of the marine platform.

Using SACS, Sinopec evaluated the structural integrity of the existing platforms to determine whether repairs were necessary, economically feasible, and could be completed effectively. Sinopec's reliance on comprehensive analysis to perform a risk-based approach to life extension of its platforms kept it from building new ones, saving millions of dollars.

Zakum Development Company (ZADCO) had to evaluate and reinstate the structural integrity of the platform that was struck by a 1,600-ton marine vessel in the Upper Zakum oil field, the fourth largest in the world. For each day that production was halted meant lost revenue for the joint-venture stakeholders, so ZADCO used analytical software to carry out the ship impact analysis in-house, which reduced project time and costs. SACS software helped ZADCO resume production sooner, and the technical documentation-generated SACS simulations allowed the company to substantiate the insurance claim resulting from the accident saving the operator considerable costs.

These three excellent examples of producers extending the life of their assets illustrate how software technology is becoming an integral part of risk-based analysis. And new technologies, such as cloud computing, mobile devices, and UAVs are already here to help continue the productive life of existing platforms. It is now a matter of getting producers to be comfortable with using them and implementing them in their daily monitoring routines.

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